

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review

Permit Issue Date:

Region: Fayetteville Regional Office
County: Montgomery
NC Facility ID: 6200087
Inspector's Name: Mitch Revels
Date of Last Inspection: 11/04/2014
Compliance Code: 3 / Compliance - inspection

Facility Data Applicant (Facility's Name): Uwharrie Mountain Renewable Energy, LLC Facility Address: Uwharrie Mountain Renewable Energy, LLC 561 Landfill Road Mount Gilead, NC 27306 SIC: 4911 / Electric Services NAICS: 221119 / Other Electric Power Generation Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V			Permit Applicability (this application only) SIP: 15A NCAC 02Q .0507, 02D .0516, 02D .0521 NSPS: Subpart JJJJ NESHAP: MACT Subpart ZZZZ PSD: N/A PSD Avoidance: N/A NC Toxics: N/A 112(r): N/A Other: GS§60.4244 (SB-3)				
Contact Data			Application Data				
Facility Contact Steve Berlinski Facility Manager (910) 572-1900 561 Landfill Road Mt. Gilead, NC 27306	Authorized Contact Gary Quantock Vice President of Operations (734) 913-5649 425 S. Main St., Suite 201 Ann Arbor, MI 48104	Technical Contact Nick Diedrich Environmental Engineer (734) 302-5392 425 South Main Street, Suite 201 Ann Arbor, MI 48104	Application Number: 6200087.15A Date Received: 03/31/2015 Application Type: Modification Application Schedule: TV-1st Time Existing Permit Data Existing Permit Number: 10226/R02 Existing Permit Issue Date: 01/07/2015 Existing Permit Expiration Date: 08/31/2017				
Total Actual emissions in TONS/YEAR:							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2015	3.21	41.24	12.60	352.30	16.66	54.81	44.22 [Formaldehyde]
2014	1.29	24.46	48.92	161.45	6.88	23.14	18.88 [Formaldehyde]
2013	---	---	---	---	---	---	.00E+00 [Acrylonitrile]
2012	---	---	---	---	---	---	.00E+00 [Acrylonitrile]
Review Engineer: Yukiko (Yuki) Puram Review Engineer's Signature: _____ Date: _____					Comments / Recommendations: Issue 10226/T03 Permit Issue Date: _____ Permit Expiration Date: _____		

1. Purpose of Application

Uwharrie Mountain Renewable Energy, LLC (UMRE) submitted an application for a renewal (1300110.14A) on March 25, 2015, or at least nine months prior to the expiration date. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied. No modification was requested with this renewal.

2. Facility Description

UMRE is owned by DTE Biomass Energy, which is a subsidiary of DTE Energy. The landfill gas was routed from Uwharrie Regional Landfill which owned and operated by Republic Services, Inc. The facility is located near the landfill where the land was leased from Republic Services, Inc. The landfill has a separate air quality permit, 08826T11.

3. History/Background/Application Chronology

Application Chronology

March 25, 2015	Application for permit renewal, 6200087.15A was received.
April 1, 2015	DAQ sent an acknowledgment letter indicating that the application for permit renewal was complete.
April 14, 2015	The Fayetteville Regional Office (FRO) submitted comments on the permit renewal application.
November 5, 2015	The facility conducted performance testing on LFG fired engine/generator EG-1 and EG-4 per NSPS Subpart JJJJ and SB-3. EG-4 was re-tested on December 8, 2015.
December 11, 2015	A request for an applicability determination was submitted. The facility was seeking for permit applicability determination of the siloxane removal system prior to the installation.
December 22, 2015	A letter of applicability determination #2757 was sent to the facility. The proposed siloxane removal system was exempt from permitting. It will be added to the insignificant source list.
June 20, 2016	DAQ's Stationary Source Compliance Branch completed the review for the performance test that was conducted on November 5, and December 8, 2015.
July 25, 2016	Mr. Mike Gurley, Environmental Manager of Republic Services, confirmed that the last expansion of the Uwharrie Environmental landfill occurred back in February 8, 2013. The facility has not constructed, re-constructed or modified the landfill since then. Based on this information, the landfill will not be subject to NSPS Subpart XXX until the next expansion occurs in the landfill. Therefore, the treatment system

at this facility (ID No. CD-Treatment) will not be subject to Subpart XXX at this modification. Mr. Gurley is not expecting an expansion of the landfill anytime soon.

July 28, 2016	The applicant was informed that they have an option to change the CO and NOx emissions to be the same standards as NSPS Subpart JJJJ. Since the DAQ changed its SB-3 policies to match the NSPS standards, the facilities can request to change the SB-3 standards.
September 23, 2016	Spoke to Mr. Diedrich over the phone and he indicated that DTE decided not to change the SB-3 emission standards because of the conflict with the PSD avoidance conditions. Per his request, the SB-3 standards will remain the same.
October 28, 2016	A draft permit and a permit review was sent to Mr. Booker Pullen of DAQ for review.
November 2, 2016	Mr. Pullen completed review with comments.
November 3, 2016	Discussed with Michael Pjetra of the Technical Assistant Section of DAQ, Mr. William Willets, Permitting Section Chief and Mr. Pullen about this facility's formaldehyde emissions. It was decided to add a formaldehyde emission test in the permit.
November 22, 2016	An updated draft permit was submitted to Mr. Pullen for review.
November 23, 2016	Mr. Pullen completed his review.
November 23, 2016	A draft permit and a permit review were submitted to Mr. Mark Hill, Responsible Official of Uwharrie Mountain Renewable Energy, Mr. Nicholas Diedrich, Mr. Gregory Reeves and Mr. Mitch Revels of Fayetteville Regional Office.
December 12, 2016	Mr. Diedrich submitted his review with comments.

4. Permit Modifications/Changes and TVEE Discussion

The following table describes the changes to the current permit as part of the renewal process.

Existing Page(s)	New Page(s)	Section	Description of Changes
Cover and throughout	Cover and throughout	-	Updated all dates and permit revision numbers. Changed the name of the department to "Department of Environmental Quality." Changed the logo, the heading and the footing. Changed the permit to the Title V format.

Existing Page(s)	New Page(s)	Section	Description of Changes
N/A	Attachment 1	-	Added a siloxane removal regeneration flare (ID No. IES-1) to the insignificant source list.
5	N/A	A.4	Removed the emissions inventory requirement. This requirement is included in the General Condition.
5	N/A	A.5	Removed the notification requirement. This requirement is included in the General Condition.
N/A	6	2.1.A.3(c)	Added a testing requirement for formaldehyde emission.
5-6	7	2.1.A.4	Added monitoring, recordkeeping and reporting requirements to the MACT Subpart ZZZZ requirements.
8	10	2.1.B	Added a new section for the landfill gas treatment system (ID No. CD-Treatment)
N/A	9	2.2	Added a permit shield for the treatment system (ID No. CD-Treatment) not being applicable to NSPS Subpart XXX.
10-12	9-17	3	Updated to Title V General Conditions, Version 4.0 12/17/15.

TV Equipment Editor was modified on September 26, 2016 and October 28, 2016. One siloxane removal regeneration flare (IES-1) was added as an insignificant source. Source descriptions were updated for the engines ES-01 through ES-06.

5. Regulatory Review

- A. Six 1.6MW electrical generators powered by landfill gas-fired IC engines (ID Nos. ES-01 through ES-06): The LFG-fired engines/generators are subject to the following regulations. The permit will be updated to reflect the most current stipulations for all applicable regulations. The order of the stipulations listed on the permit was listed by numerical order.

15A NCAC 2D .0516: SULFUR DIOXIDE EMISSIONS FROM COMBUSTION SOURCES

The engines/generators (ID Nos. ES-01 through ES-06) are subject to this regulation. No change in this regulation.

15A NCAC 2D .0521: CONTROL OF VISIBLE EMISSIONS

The engines/generators (ID Nos. ES-01 through ES-06) are subject to this regulation. No change in this regulation.

15A NCAC 2D .0524, 40 CFR Part 60, Subpart JJJJ “New Source Performance Standards for

Stationary Non-Emergency Spark Ignition Engines” The engines/ generators (ID Nos. ES-01 through ES-06) are subject to 40 CFR Part 60, Subpart JJJJ. Each engine was rated at 1600kW and the maximum output was rated at 2233 hp. Since these are non-emergency engines, and are not certified by the manufacturer, the Permittee is required to perform stack testing in accordance with §60.4243(b)(2)(ii) and §60.4244. According the DAQ’s database, the facility conducted initial performing testing on ES-03 and ES-05 on November 4, 2014 and subsequent testing on ES-01 and ES-04 on December 8, 2015. The engines need to be tested every 8,760 hours or 3 years, whichever comes first. The facility has a permission to test only two engines at a time to represent all six engines as long as they rotate the two engines that are tested. The standards for the engines are 2.0 g/HP-hr for NOx, 5.0 g/HP-hr for CO, 1.0 g/HP-hr for VOC, or 150 ppmvd for NOx, 610 ppmvd and 80 ppmvd for VOC (all at 15% O2).

15A NCAC 2D .1111, 40 CFR Part 63, MACT Subpart ZZZZ – The engines ES-01 through ES-06 are subject to MACT Subpart ZZZZ. According to the stack test report dated June 20, 2016, the potential formaldehyde emission for each engine is 10.99 tons per year or 65.28 tons/year for all engines. This would make the facility a major source of HAPs. Therefore, the permit must include requirements for a stationary RICE that is located at a major source of HAPs. According to §63.6600(c), however, a stationary RICE that combusts landfill gas equivalent to 10 % or more of the gross heat input on an annual basis is exempt from the emission limitations of this subpart. However, that facility must meet the additional monitoring, recordkeeping and reporting requirements. The following conditions will be added to the permit:

15A NCAC 2D .1111: National Emission Standards for Hazardous Air Pollutants

The Permittee shall comply with all applicable provisions, including the monitoring, recordkeeping, and reporting contained in Environmental Management Commission Standard 15A NCAC 02D .1111 "Maximum Achievable Control Technology" (MACT) as promulgated in 40 CFR 63, "Subpart ZZZZ-National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines."

Monitoring/Recordkeeping/Reporting [15A NCAC 02Q .0508(f), §63.6590]

The Permittee shall meet the monitoring, recordkeeping, reporting, and notification requirements of 40 CFR Part 63, Subpart ZZZZ by meeting the requirements of §§63.6625(c), 63.6650(g) and 63.6655(c).

i. Monitoring [§63.6625(c)]

The Permittee shall monitor and record daily fuel usage with separate fuel meters to measure the volumetric flow rate of each fuel. In addition, the Permittee must operate the RICE in a manner which reasonably minimizes HAP emissions.

ii. Reporting [§63.6650(g)]

The Permittee shall submit an annual report, acceptable to the Regional Air Quality Supervisor, on or before January 30 of each calendar year.

The report shall contain the following:

- (A) Fuel flow rate of each fuel and the heating values that were used in your calculations. The Permittee must demonstrate that the percentage of heat input provided by landfill gas or digester gas, is equivalent to 10 percent or more of the gross heat input on an annual basis.
- (B) The operating limits provided in your federally enforceable permit, and any deviations from these limits.
- (C) Any problems or errors suspected with the meters.

State BACT Analysis and Evaluation [NCGS §62-133.8(g)] - NCGS§62-133.8 (SB-3) contains a requirement for any biomass combustion process that is otherwise not subject to the Best Available Control Technology (BACT) requirements of the PSD program, and that is determined to be a 'new renewable energy facility' to meet BACT. The facility showed compliance with the current BACT limits through the stack tests conducted on November 2, 2015 and December 8, 2015. Recently, the DAQ changed its policy for the SB-3 BACT limits for LFG-fired engines. Mr. Nick Diedrich of DTE Energy Resources was informed that the facility has an option to increase the SB-3 limits to match the NSPS standards. However, this particular facility used the current SB-3 limits to calculate potential emissions for PSD. If the limits are increased, the facility could possibly be subject to the PSD program. DTE decided not to change the CO emission limit on SB-3, however, they requested

to raise the NO_x emissions to match the NSPS standard. To ensure the facility being not subject to the PSD conditions, the NO_x emissions was evaluated:

$$\frac{2.0g\ NOx}{Hp - hour} \times \frac{2233\ Hp}{unit} \times 4\ units \times \frac{8760\ hours}{year} \times \frac{1\ lb\ NOx}{453.59g\ NOx} \times \frac{ton}{2000\ lbs} = \frac{172.5\ tons\ NOx}{year}$$

**When the facility was first constructed, the facility had only four engines. Two engines were added later. Because of the way they were permitted, the first four engines' potential emissions can be up to 250 tpy, then the emissions from the other two engines can go up to 250 tpy without being subject to the PSD program. Therefore, the emissions from the first four engines were calculated.*

As shown in the calculation above, the potential NO_x emission does not exceed 250 tons/year. Therefore, this facility is not subject to the PSD program even if the SB3 emission limit for NO_x was raised to 2.0 g/Hp-hour. As requested, the NO_x emission limit was raised to 2.0g NO_x/HP-hour.

B. One Landfill Gas Treatment System (ID No. CD-Treatment)

The landfill gas treatment system is currently subject to NSPS Subpart WWW. There are no recordkeeping, notification or reporting requirements associated with this control device. However, the treatment system becomes subject to NSPS Subpart XXX when Uwharrie Environmental Landfill which operates under a separate air quality permit (permit #09847T01) becomes subject to Subpart XXX. If the treatment system becomes subject to NSPS Subpart XXX, the facility must submit a monitoring plan for the treatment system. The facility must notify the DAQ to modify the permit upon the landfill expansion. This requirement was added to the permit shield for a non-applicable requirements in Section 2.2.

6. NSPS, NESHAPS/MACT, NSR/PSD, 112(r), RACT, CAM

Uwharrie Mountain Renewable Energy, LLC is subject to NSPS Subpart JJJJ, Subpart WWW and MACT Subpart ZZZZ. See Section 5 above for the applicable requirements.

The facility originally owned and operated four engines (ES-01 through 04). Additional two engines (ES-05 and 06) were added to Permit R01. According to Permit Review R01, total CO emissions for the original four engines were 237.2 tpy and two additional engines added 118.6 tpy of CO. Since the PSD increment was less than 250 tpy, it did not trigger the PSD applicability. Therefore, this facility is appeared to be PSD minor. The facility is not subject to 112(r), RACT or CAM.

7. Facility Wide Air Toxics

The engines EG-01 through 06 are exempt from the toxics rules per GS 143-215.102(a) and 15A NCAC 02Q .0702(a)(27)(B). The sources did not appear to cause an unacceptable health risk per Air Permit Review R01. Therefore, the sources are exempt from the toxic rules.

When the facility conducted a source test demonstrating compliance with NSPS Subpart JJJJ on November 2, 2015, formaldehyde emissions were also measured by FTIR in additions to the pollutants required by NSPS Subpart JJJJ. According to the test results, the calculated average formaldehyde emission rate was 2.48 lb/hr. When the facility conducted an air emission modeling analysis in 2013, however, the formaldehyde emissions were 96% of the AAL with 1.9 lb/hr of emission rate. The emission rate measured on November 2, 2015 was much higher than the input that was used for the modeling, which indicated the formaldehyde emissions from the engines might have

exceeded the AAL. According to Mr. Diedrich of DTE, the testing on November 2, 2015 was not calibrated to measure formaldehyde emissions correctly, therefore the test result does not demonstrate accurate formaldehyde emissions. Because the modeling analysis showed formaldehyde emissions being 96 % of the AAL, the DAQ requested the facility to conduct formaldehyde emissions from the engine (ID No. ES-01 through ES-06) to ensure the sources not causing an unacceptable health risk per 15A NCA 02Q .508(i)(16). Therefore, a source test requirement for formaldehyde emissions was added to Section 2.1.A.3(c) of the permit.

8. Facility Emissions Review

Uwharrie submitted facility-wide potential emissions and potential emissions with the application. The following table indicates facility's potential emissions in tons/yr:

	ES-01	ES-02	ES-03	ES-04	ES-05	ES-06	Facility-wide PTE
*CO	71.15	71.15	71.15	71.15	71.15	71.15	426.93
*NO _x	10.78	10.78	10.78	10.78	10.78	10.78	64.69
PM	3.23	3.23	3.23	3.23	3.23	3.23	19.41
SO ₂	9.60	9.60	9.60	9.60	9.60	9.60	57.58
VOC	21.56	21.56	21.56	21.56	21.56	21.56	129.37
Formaldehyde	8.32	8.32	8.32	8.32	8.32	8.32	49.93
Total HAPs	10.87	10.87	10.87	10.87	10.87	10.87	65.22

*SB-3 limits were used to calculate the potential emissions.

9. Compliance Status

Uwharrie has no violation in the past five years according to the DAQ's database. During the most recent inspection, conducted on August 3, 2016 by Mr. Mitch Revels of the FRO, the facility appeared to be in compliance with all applicable requirements.

10. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 2Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. The US EPA will also be given a 45 day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and the EPA. Pursuant to 15A NCAC 2Q .0522, a copy of each permit application, each proposed permit and each final permit pursuant shall be provided to EPA.

11. Other Regulatory Considerations

- A P.E. seal is NOT required for this application.
- A zoning consistency determination is NOT required for this application.
- No increase in potential emissions are expected from this permit action for the PSD tracking purpose.

12. Recommendations

The renewal application for Uwharrie Mountain Renewable Energy, LLC located in Mt. Gilead, Montgomery County, NC has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. The DAQ recommends the issuance of Air Permit No. 10226T03.